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### Remarks:

This application was filed on 31 - 07 - 1997 as a divisional application to the application mentioned under INID code 62.

### (54) A conveying system

(57) The invention relates to a conveying system provided with a rail system and with a trolley for accommodating goods, which, is movable along said rail system. Said rail system is in at least one discharge station for discharging goods from said trolley provided with means for placing at least one supporting surface supporting said goods in a sloping position, such that any

goods present on said trolley can slide from the trolley through an outlet opening, transversely to the direction of movement of the trolley during operation. At least one closing means is provided, by which said outlet opening can be opened or closed, at least in the discharge station.

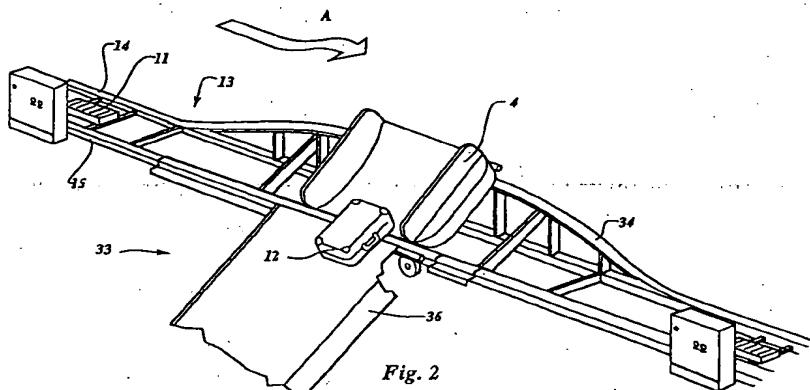


Fig. 2

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## Description

The invention relates to a conveying system provided with a rail system and with a trolley for accommodating goods, which is movable along said rail system, whereby said rail system is in at least one discharge station for discharging goods from said trolley provided with means for placing at least one supporting surface supporting said goods in a sloping position, such that any goods present on said trolley can slide from the trolley through an outlet opening, transversely to the direction of movement of the trolley during operation, whilst at least one closing means is provided, by which said outlet opening can be opened or closed, at least in the discharge station.

When using a construction of this type the discharge or not of goods on the trolley can be controlled in a simple manner in that the outlet opening is opened or not.

The invention will be explained in more detail with reference to the accompanying figures.

Figure 1 is a diagrammatic perspective view of a part of the conveying system according to the invention.

Figure 2 is diagrammatic perspective view of a discharge station, where the contents of a trolley can be discharged from the trolley.

Figure 3 shows a mechanism for driving the trolley near the discharge station.

Figure 4 shows another embodiment of a mechanism for driving the trolley near the discharge station.

Figures 5-8 show variants of the embodiment according to figure 2.

The conveying system shown in figure 1 comprises a first rail track 1, which comprises a pair of rails 2 and 3 extending parallel to each other.

A trolley 4 is movable over said rails. The trolley 4 is thereby supported by running wheels provided at its bottom side, which roll over the upper surfaces of the rails 2 and 3. Linear motors 11, which are known per se, may be provided for driving the trolley 4.

A conveying system of this type may for example be used at airports for conveying the luggage 12 of air passengers.

Generally the luggage or the trolley are thereby provided with electronically read codes, by means of which the trolley can be transported to a predetermined station. For that purpose additional rail tracks 13 are connected to the main rail track 1, generally at several points, via which a trolley may for example be guided to a predetermined station so as to deliver the luggage 12. Such an additional rail track 13 is again provided with a pair of rails 14 and 15 extending parallel to each other, which correspond with the rails 2 and 3.

A switch device 16 is provided near the connection of the rail track 13 to the rail track 1 for diverting a trolley from the rail track 1 to the rail track 13. The switch device 16 as e.g. described in EP-A-0 659 624 is not part of the present invention and so it will not be necessary to give a detailed description of said switch device.

A further switch means (not shown) may be used for guiding the trolley back from rail track 13 to rail track 1.

Rail track 13 may for example lead to a discharge station 33, as is diagrammatically illustrated in figure 2. In the embodiment illustrated in said figure an upwardly curved rail portion 34 is provided on the rail 14, so that during the movement of the trolley 4 over the rail track 7 said trolley 4 can be moved to such a position, that the surface 35 supporting the luggage will take such an inclined position that the luggage 12 will slide from the trolley under the influence of gravity, and will be received on for example a conveyor belt 36 or the like for the further discharge of the luggage.

It will be apparent that the construction may also be such that an elevated portion is provided on the rail 15, so that the luggage is delivered on the side of the rail track 13 opposite the side shown in figure 2. Furthermore the curved rail portion 34 may be a downwardly curved rail portion.

In order to be able to drive the trolley 4 positively in the discharge station 33, a bar-like means 37 extending parallel to the intended direction of movement is secured to the frame of the trolley 4, said bar-like means 37 near the discharge station 33 being guided by a plurality of spaced-apart guide rollers 38 or the like (figure 3) extending above said bar-like means. The upper part of a driven endless conveyor belt 39 extending parallel to said bar-like means engages on the bottom side of the bar-like means 37. In order to ensure a satisfactory contact between the upper part of the endless conveyor belt 39 and the bar-like means 37 supporting rollers 40 are provided under the upper part of the endless conveyor belt 39.

In another embodiment an endless conveyor belt or chain may be used, to which supporting rollers are secured, which run over a guideway.

Figure 4 shows a variant to the embodiment of figure 3, wherein the same reference numerals are used for those parts of figure 3 that correspond with the parts illustrated in figure 3.

In the embodiment of figure 4 a number of rollers 41, which can be driven during operation, are arranged one behind the other, said rollers engaging on the bottom side of the bar-like means 37, as will be apparent from figure 4. The rollers 41 may thereby be driven from a single driving source (not shown), because the rollers are interconnected by means of chains or belts 42, as is diagrammatically illustrated in figure 4.

Dependant on the operating conditions, such as the weight of the trolley 4, the weight of the cargo on trolley 4, the steepness of the curved rail etc., spring-loaded rollers 38 may or may not be used.

Figures 5-8 show a few variants to the embodiment according to figure 2 and consequently like parts are numbered alike in the various figures.

As will be apparent from figure 2 the space in the trolley 4 for accommodating the luggage 12 is open at the opposite sides, so that the luggage will slide from

the trolley under the influence of gravity when at least the supporting surface 35 of the trolley is tilted.

It may be desirable, however, to provide a possibility of stopping the luggage when passing a discharge station, so as to discharge said luggage in a discharge station located further downstream.

In the embodiment of figure 5 a flap 43 is provided near each end of supporting surface 35 for that purpose, said flap being pivotally coupled to the trolley by means of arms 44 and pivot pins 45 extending parallel to the intended direction of movement of the trolley. The flap 43 may thereby be pivoted, for example by guide means (not shown) provided along the rail track 13 or by setting means (not shown), between an upwardly pivoted position shown at the top of figure 5, in which the opening located near that end of the supporting surface 35 is closed, and a position shown near the bottom end of the trolley in figure 5, in which the opening of the cargo space of the trolley located near the conveyor belt 36 is released and the luggage can slide from the cargo space of the trolley 4 in the manner shown in figure 5.

Figure 6 shows a similar embodiment, wherein closing means or walls 46 capable of upward and downward movement are provided near opposite sides of the trolley, which closing means or walls can be moved upward and downward by guide means or setting means.

Figure 7 shows an embodiment wherein flaps 46' are provided near the ends of the supporting surface, said flaps being capable of pivoting movement about pivot pins located near their bottom ends, between a closed position and an open position, in which said flaps 46' extends over the conveyor belt 36.

In the embodiment according to figure 8 a slide or closing means 47 capable of upward and downward movement is provided near the end of a conveyor belt 36 or the like connecting to the rail track 13, which slide or closing means 47, as will be apparent from figure 8, may be moved to a first downward position, in which the opening of a trolley passing the respective station is released and the luggage or the like can thus slide from the trolley, and to a second position shown on the right in figure 8, in which the closing means 47 moved to its upward position will prevent material present on a passing trolley 4 from being discharged.

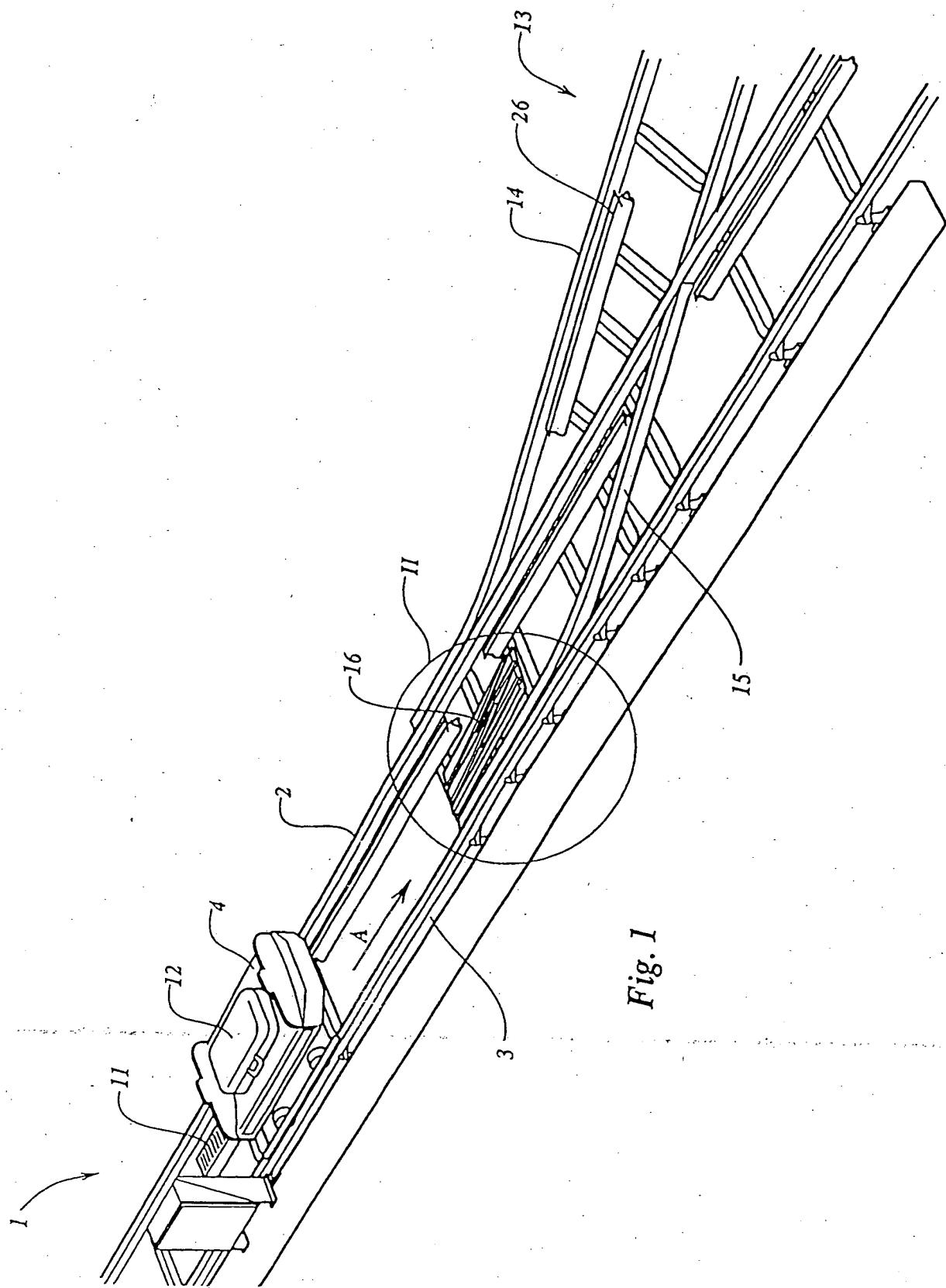
A discharge station 32 may comprise one or more discharge conveyors 36.

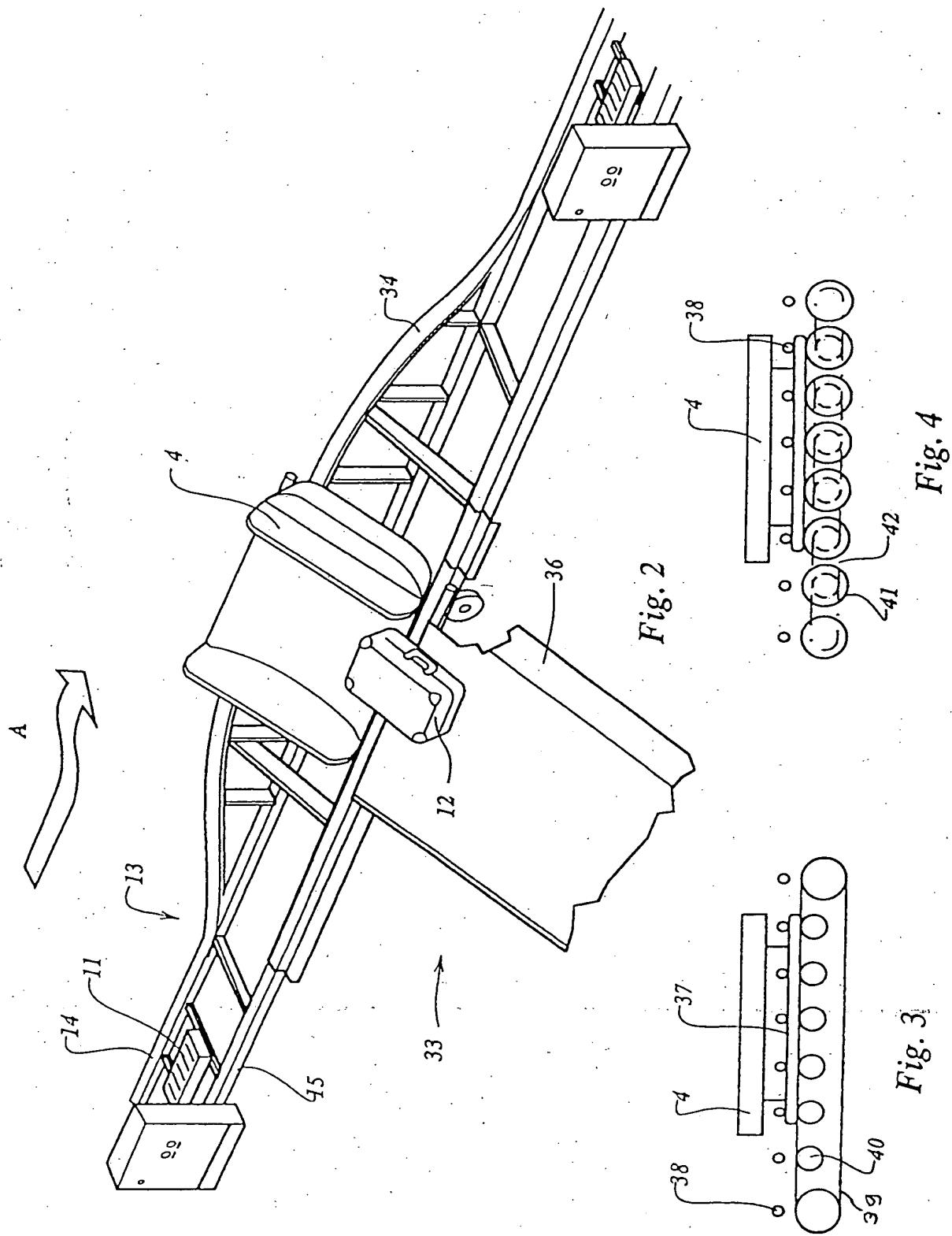
### Claims

1. A conveying system provided with a rail system (1, 13) and with a trolley (4) for accommodating goods (12), which is movable along said rail system, whereby said rail system is in at least one discharge station (33) for discharging goods (12) from said trolley (4) provided with means (34) for placing at least one supporting surface supporting said goods (12) in a sloping position, such that any goods (12) present on said trolley (4) can slide from

the trolley (4) through an outlet opening, transversely to the direction of movement (A) of the trolley (4) during operation, whilst at least one closing means (43, 46, 46', 47) is provided, by which said outlet opening can be opened or closed, at least in the discharge station.

2. A conveying system according to claim 1, characterized in that said closing means (43) is connected to said trolley (4).
3. A conveying system according to claim 1 or 2, characterized in that said closing means (46) is connected to said trolley so as to be vertically adjustable.
4. A conveying system according to claim 1 or 2, characterized in that said closing means (43) is pivotally coupled to said trolley (4).
5. A conveying system according to claim 1, characterized in that said closing means (47) is disposed in said discharge station.
6. A conveying system according to any one of the claims 1-5, characterized in that the rail system (13) is disposed at an angle with the horizontal in a discharge station.
7. A conveying system according to any one of the claims 1-6, characterized in that the discharge station (33) has been provided with drive means (39, 41) for driving a trolley.
8. A conveying system according to claim 7, characterized in that a trolley (4) has been provided with a bar-like means extending in the intended direction of movement (A) of the trolley (4) and cooperating with said drive means.





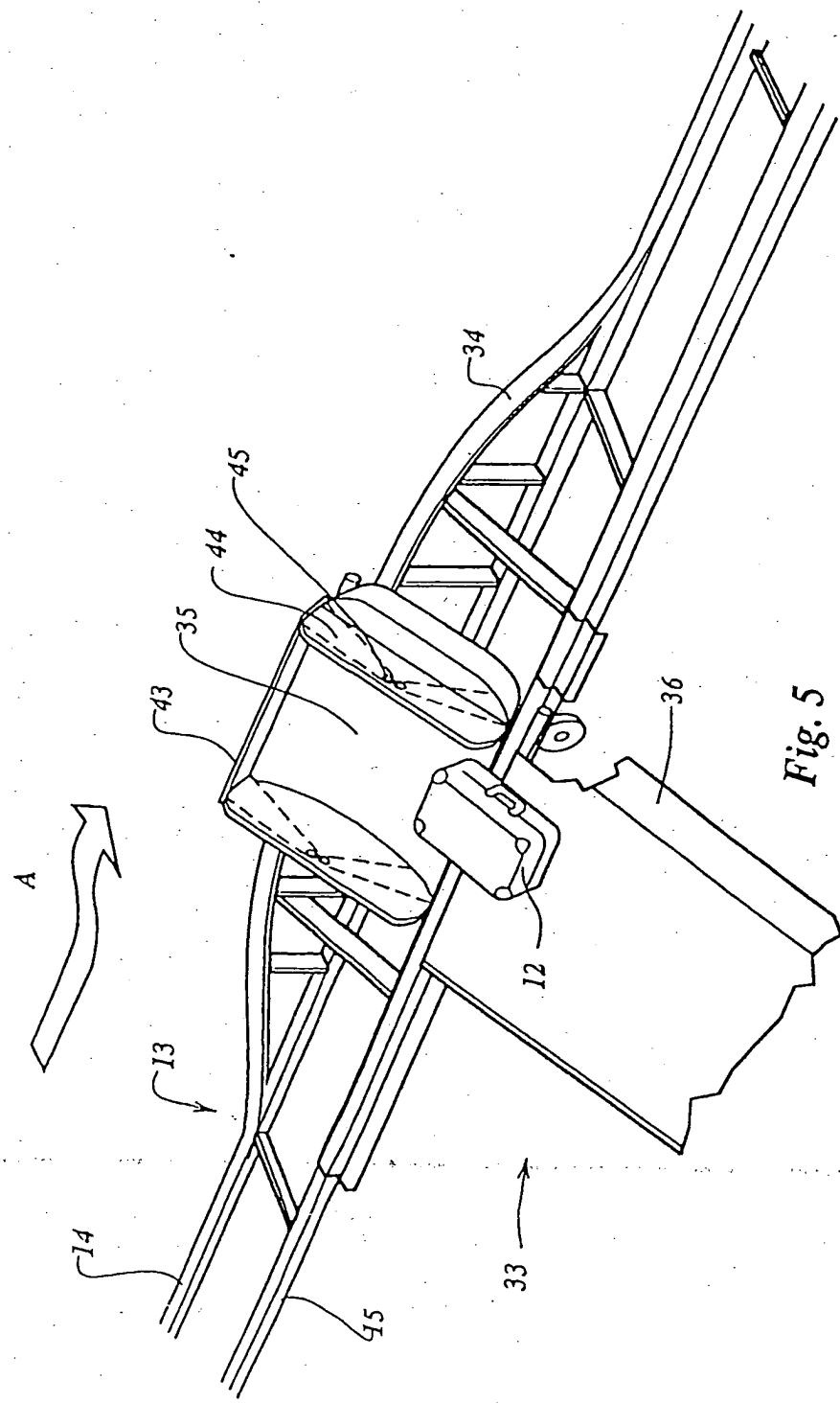
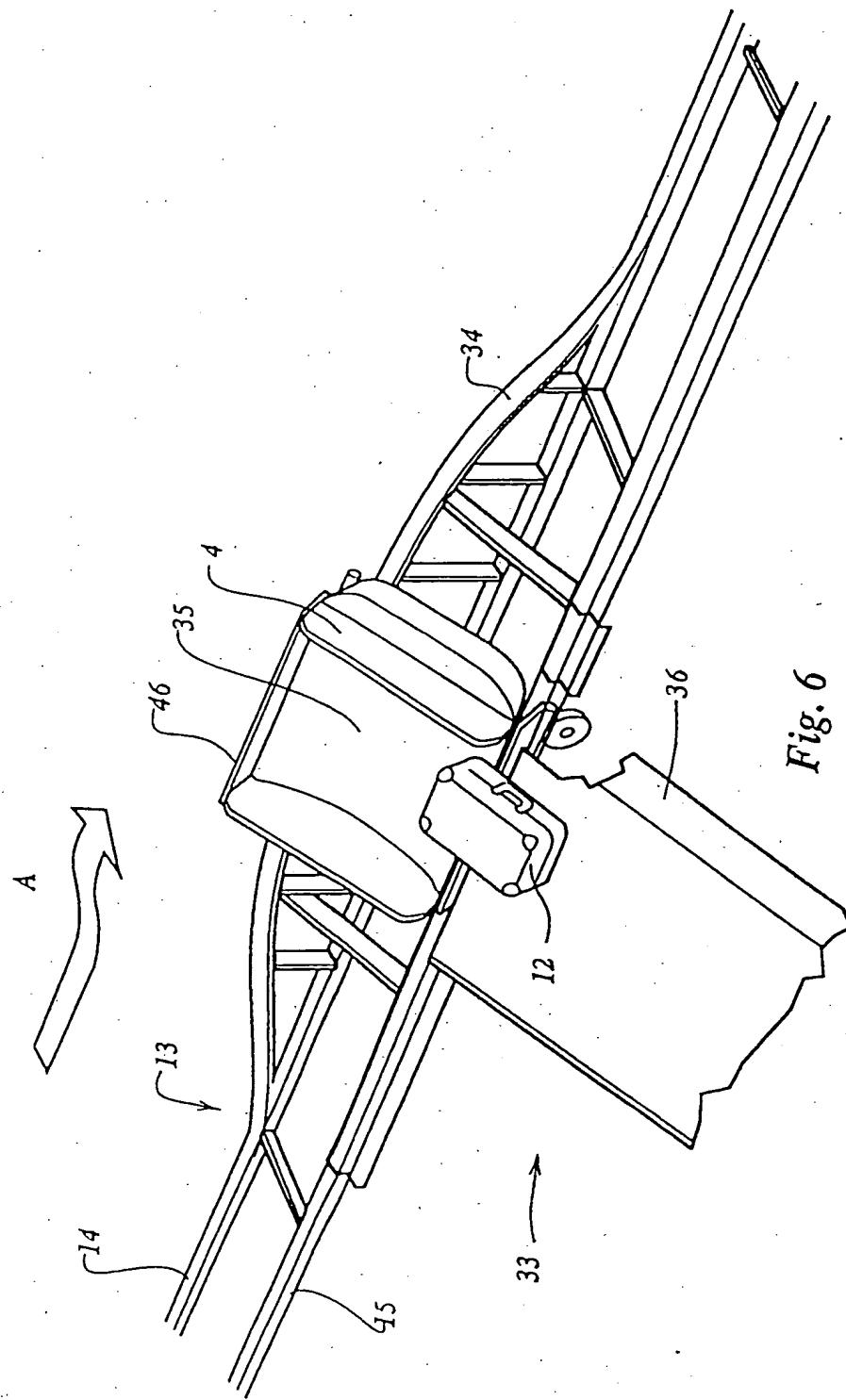


Fig. 5



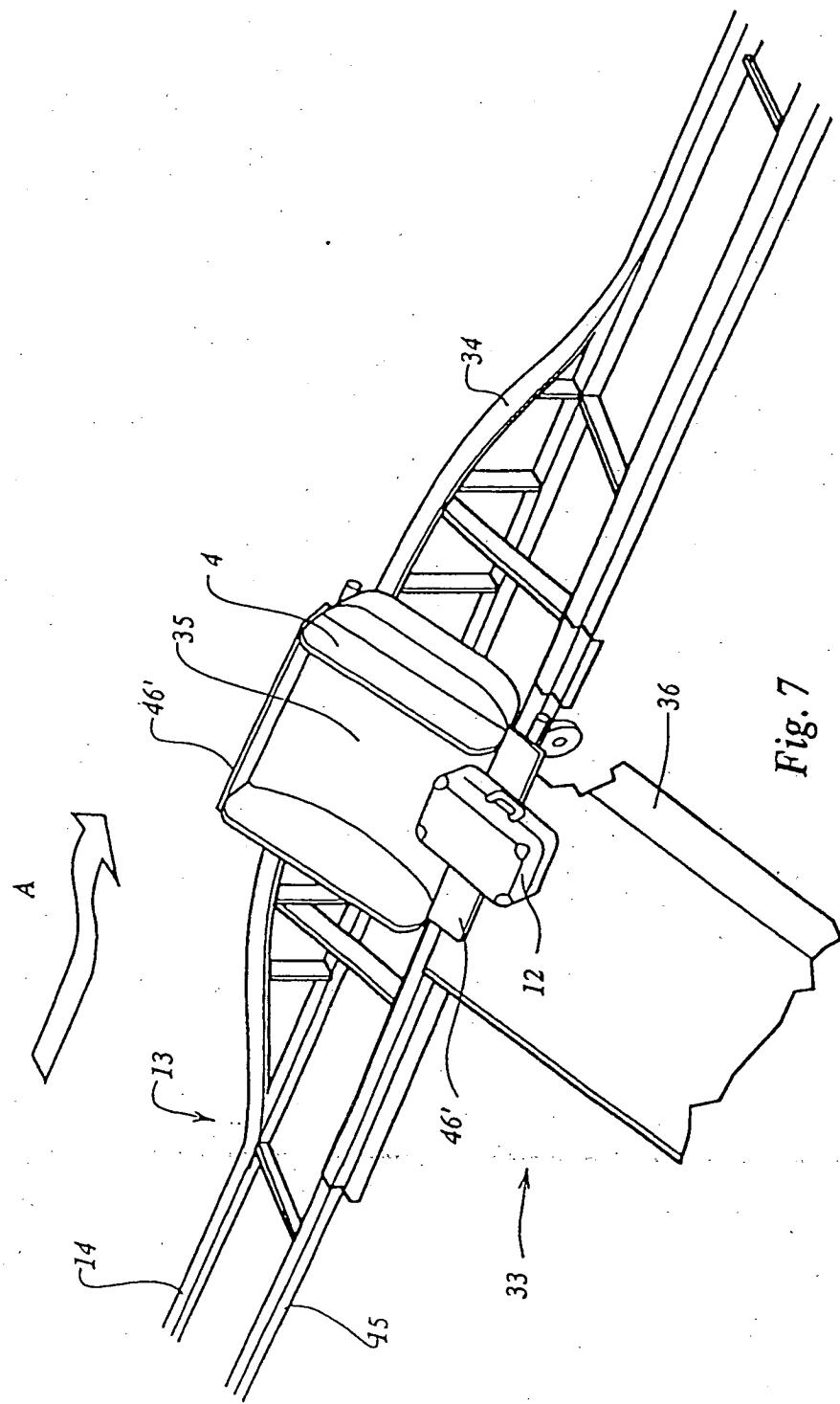


Fig. 7

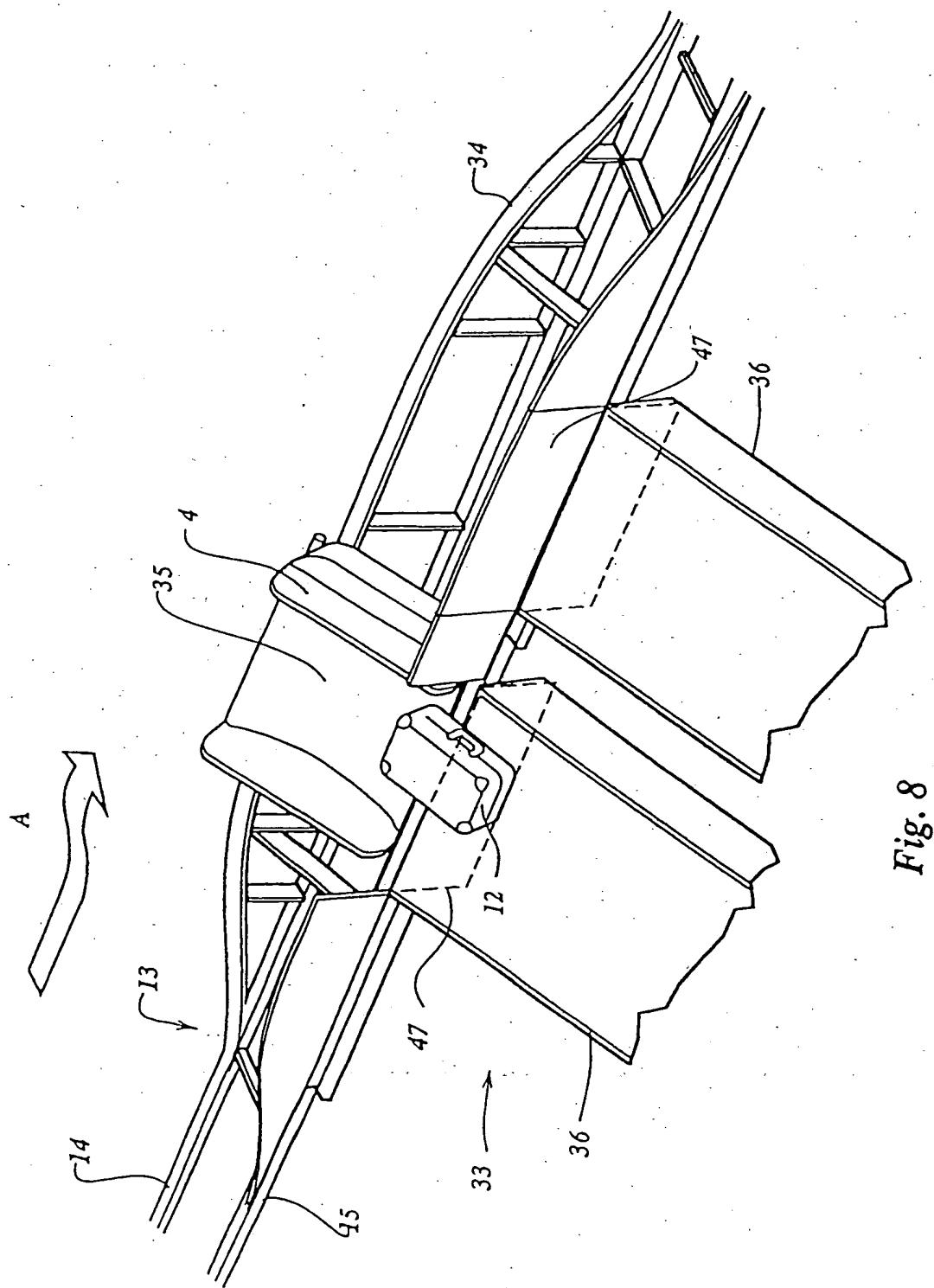


Fig. 8

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